FIG.1

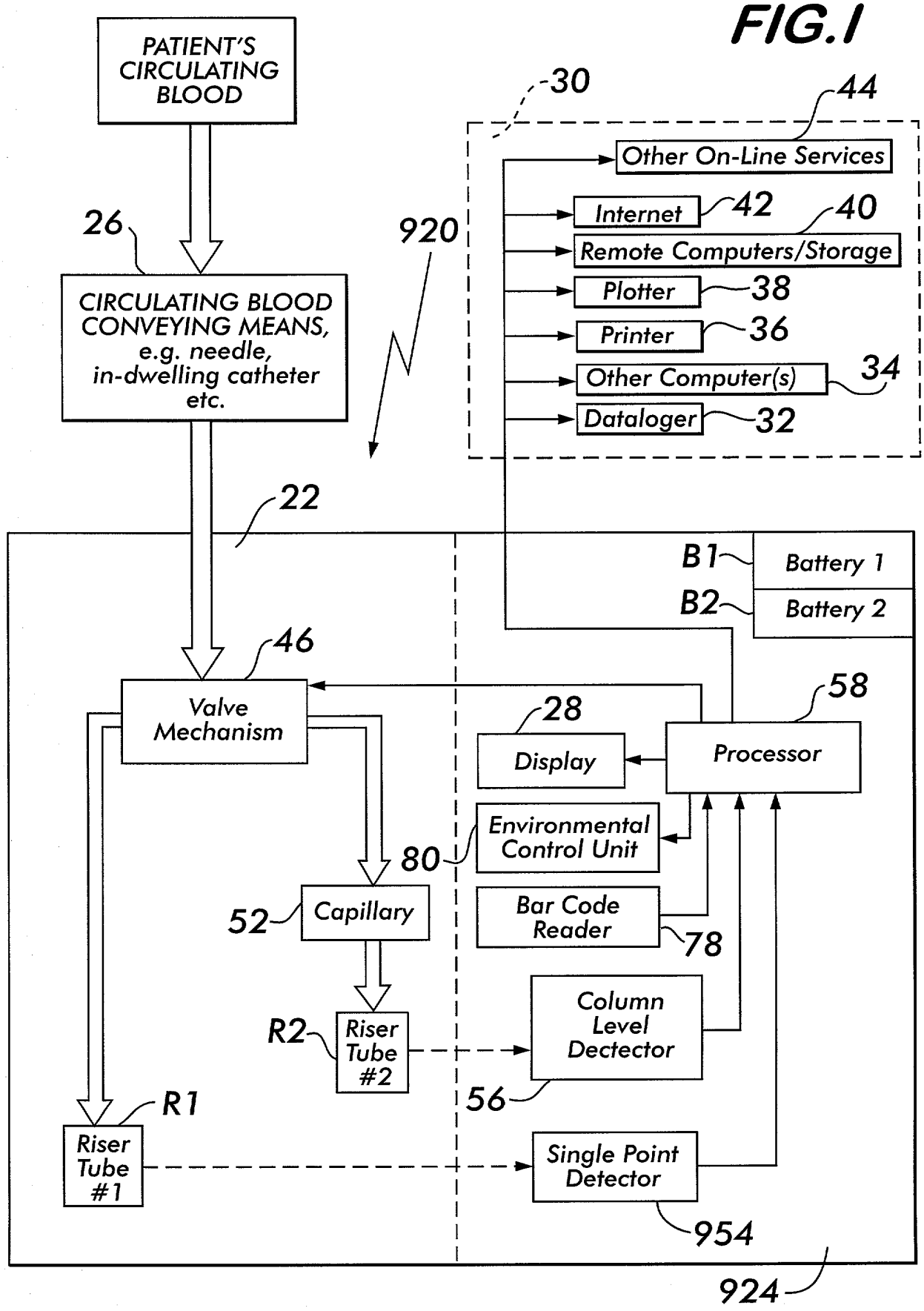

PATIENT'S CIRCULATING BLOOD
26
CIRCULATING BLOOD CONVEYING MEANS, e.g. needle, in-dwelling catheter etc.
920
30
44
Other On-Line Services
Internet
42
40
Remote Computers/Storage
Plotter
38
Printer
36
Other Computer(s)
34
Datalogger
32
22
B1
Battery 1
B2
Battery 2
46
Valve Mechanism
58
28
Display
Processor
Environmental Control Unit
80
52
Capillary
Bar Code Reader
78
Column Level Dectector
R2
Riser Tube #2
56
R1
Riser Tube #1
Single Point Detector
954
924

FIG.2

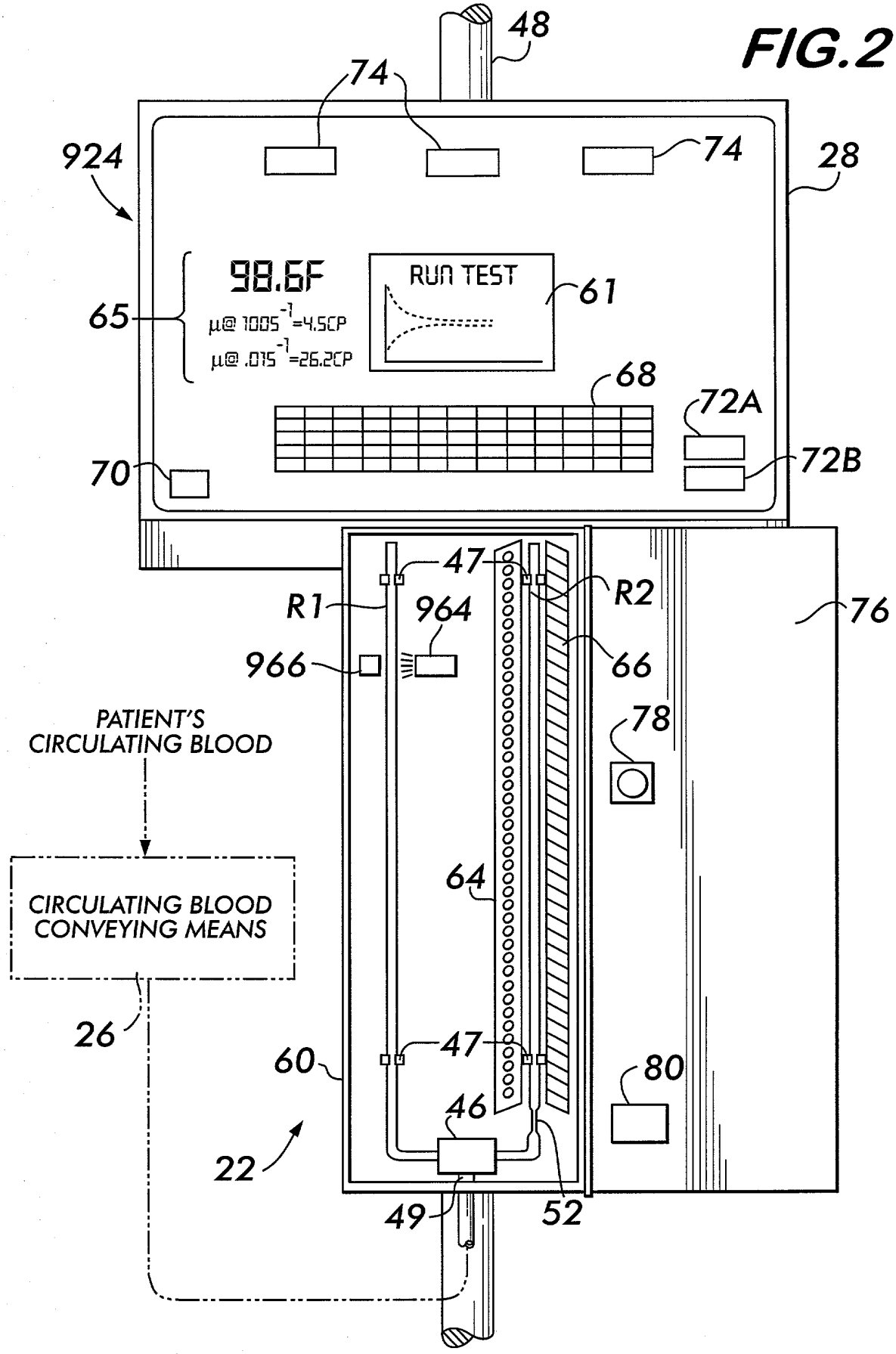

48
74
74
924
28
98.6F
μ@ 1005^{-1}=4.5CP
μ@ .015^{-1}=26.2CP
65
RUN TEST
61
68
72A
72B
70
47
R1
964
R2
76
966
66
PATIENT'S
CIRCULATING BLOOD
78
64
CIRCULATING BLOOD
CONVEYING MEANS
26
47
60
80
46
22
49
52

FIG.3

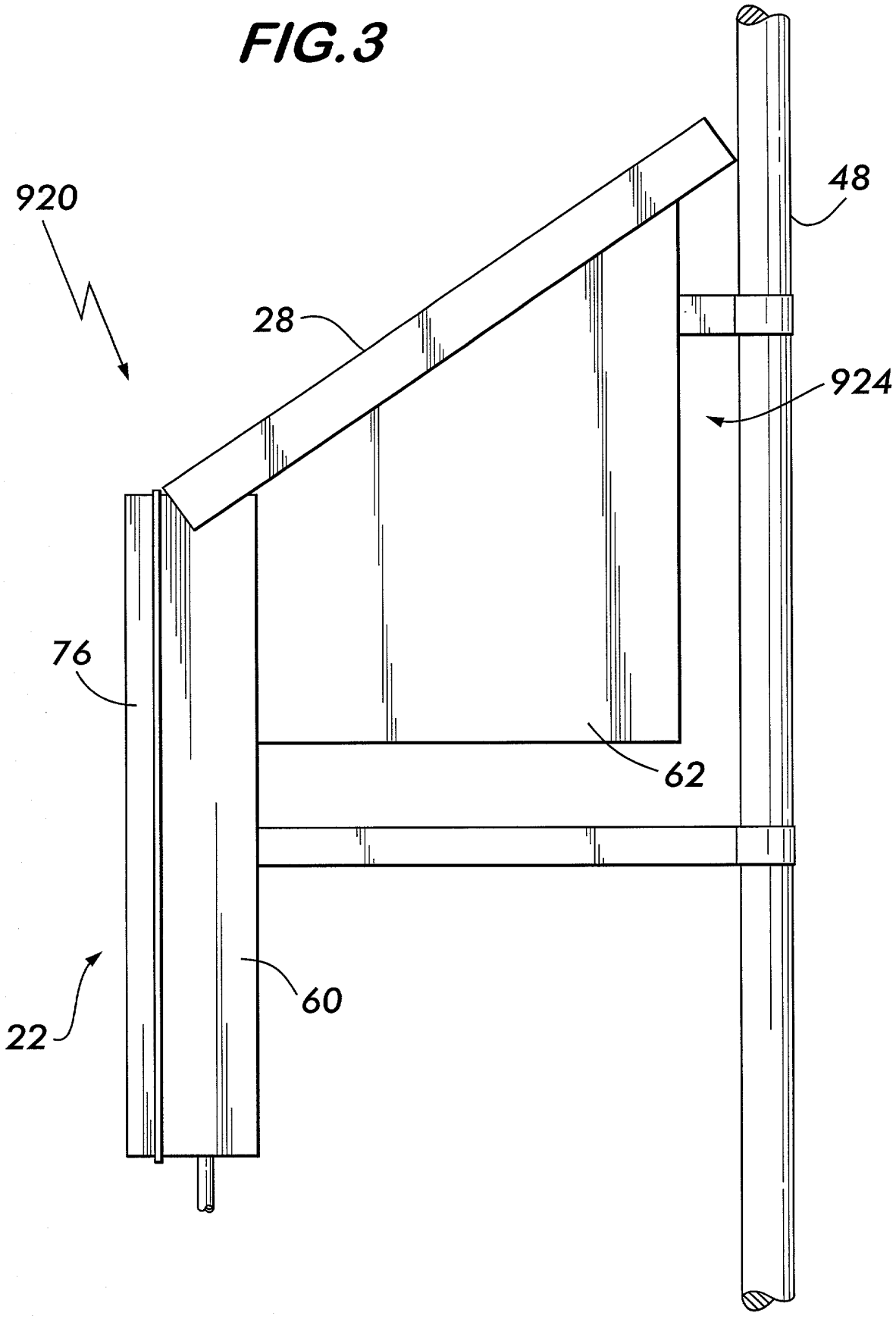


FIG.4

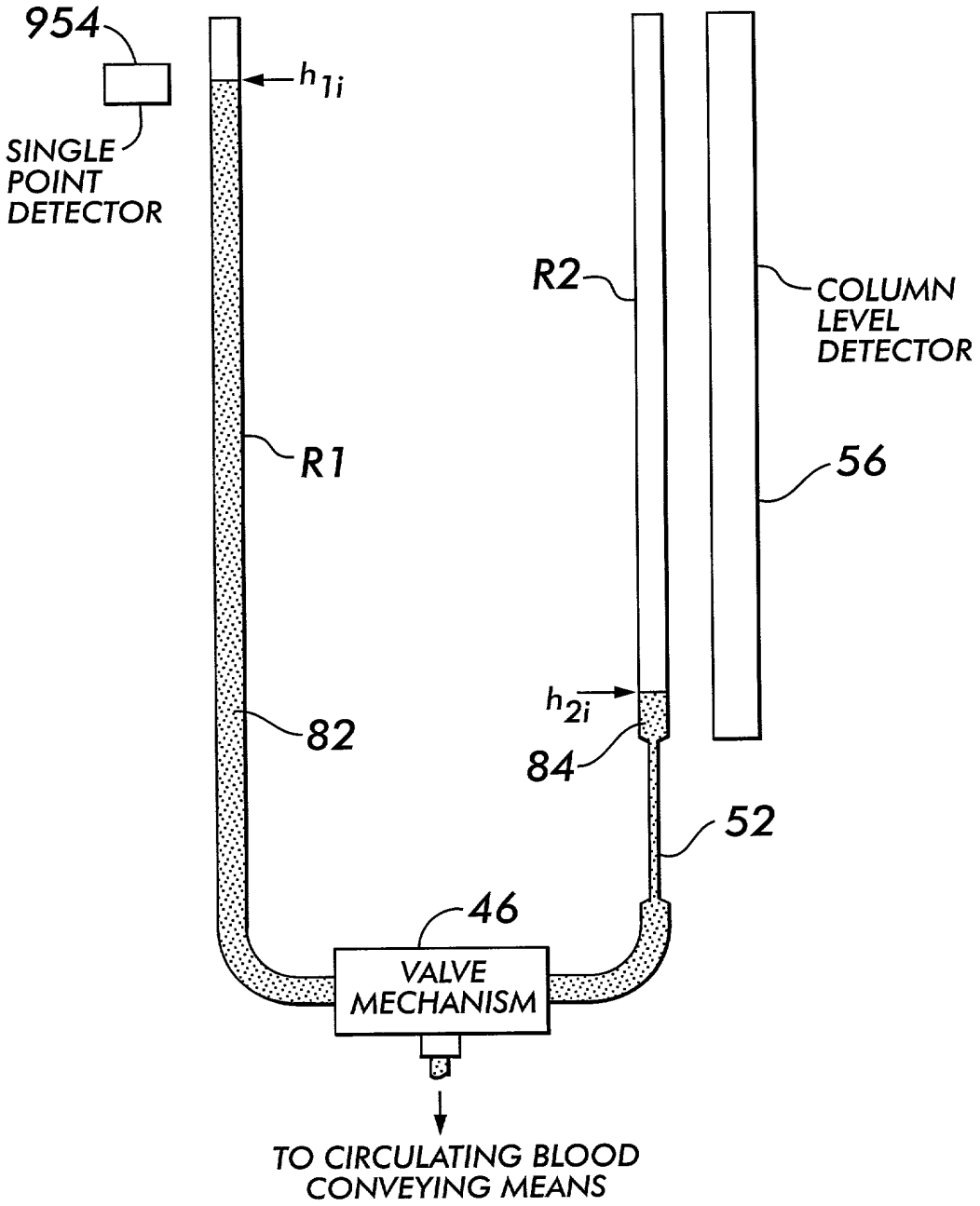

954
SINGLE POINT DETECTOR
h_{1i}
R1
82
R2
COLUMN LEVEL DETECTOR
56
h_{2i}
84
52
46
VALVE MECHANISM
TO CIRCULATING BLOOD CONVEYING MEANS

FIG.5

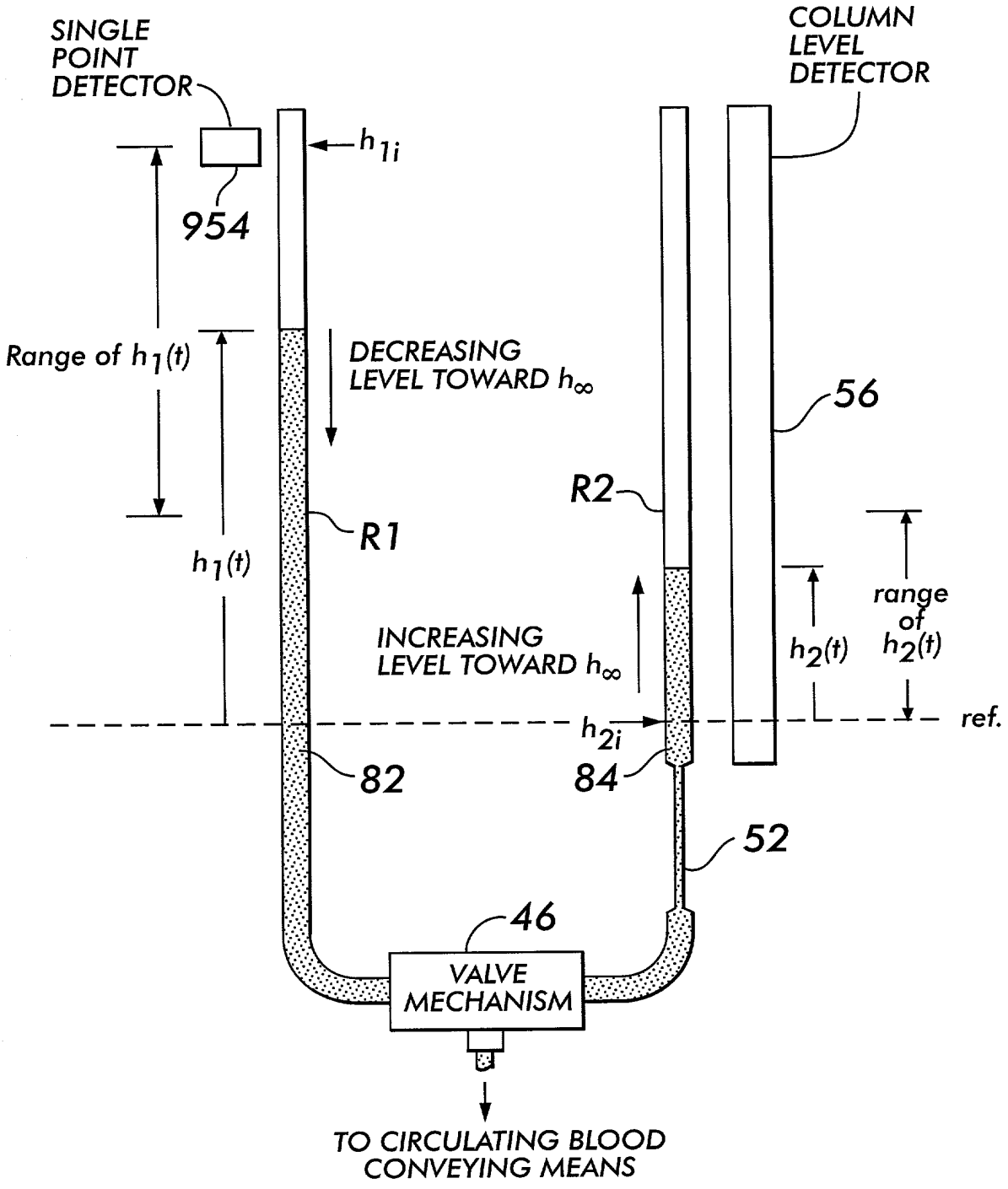
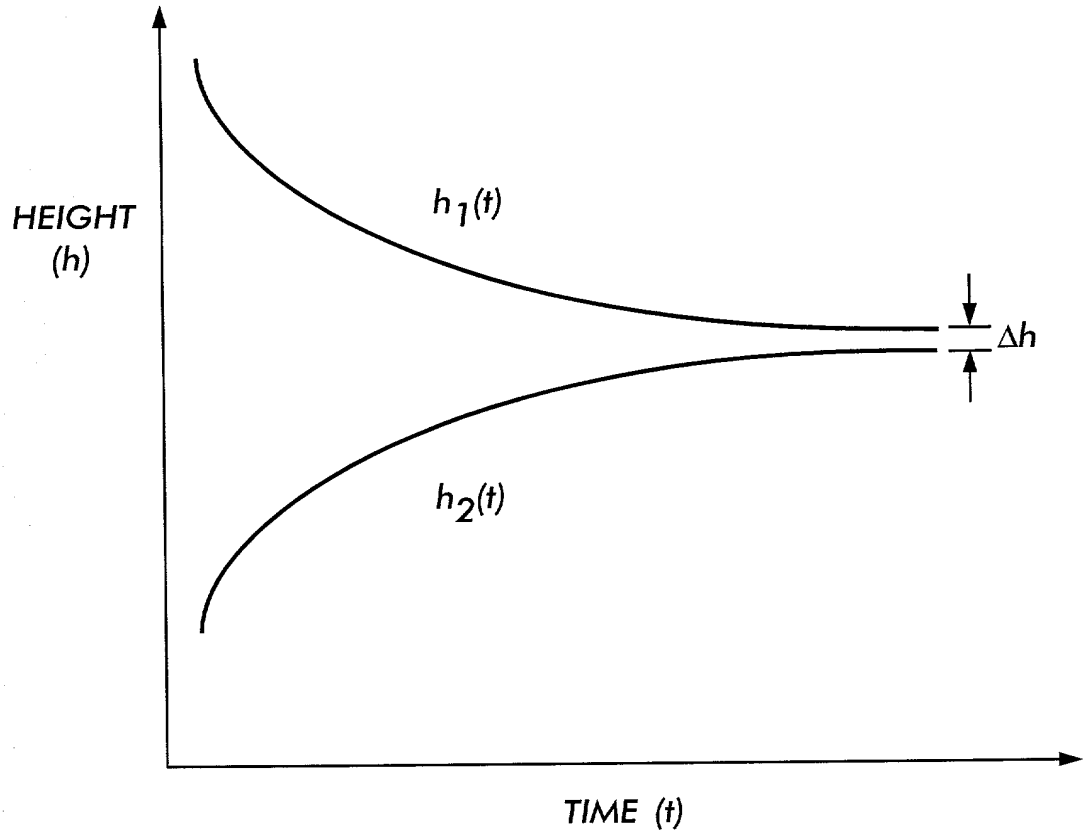

SINGLE POINT DETECTOR
COLUMN LEVEL DETECTOR
954
h_{1i}
Range of $h_1(t)$
DECREASING LEVEL TOWARD h_∞
56
R2
R1
$h_1(t)$
INCREASING LEVEL TOWARD h_∞
$h_2(t)$
range of $h_2(t)$
h_{2i}
ref.
82
84
52
46
VALVE MECHANISM
TO CIRCULATING BLOOD CONVEYING MEANS

FIG.6


HEIGHT
(h)
$h_1(t)$
Δh
$h_2(t)$
TIME (t)

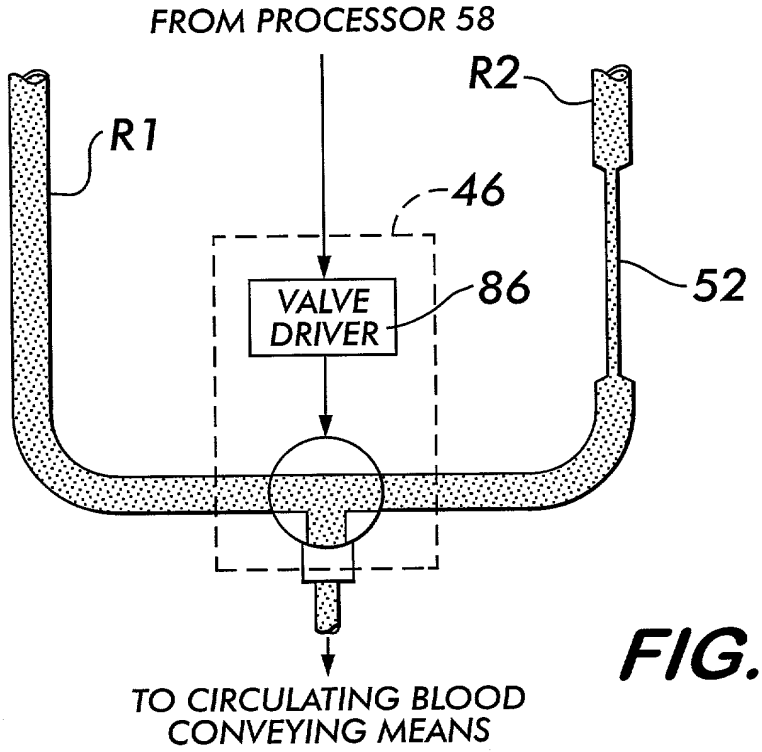

FROM PROCESSOR 58
R2
R1
46
VALVE
DRIVER
86
52
TO CIRCULATING BLOOD
CONVEYING MEANS

FIG.7A

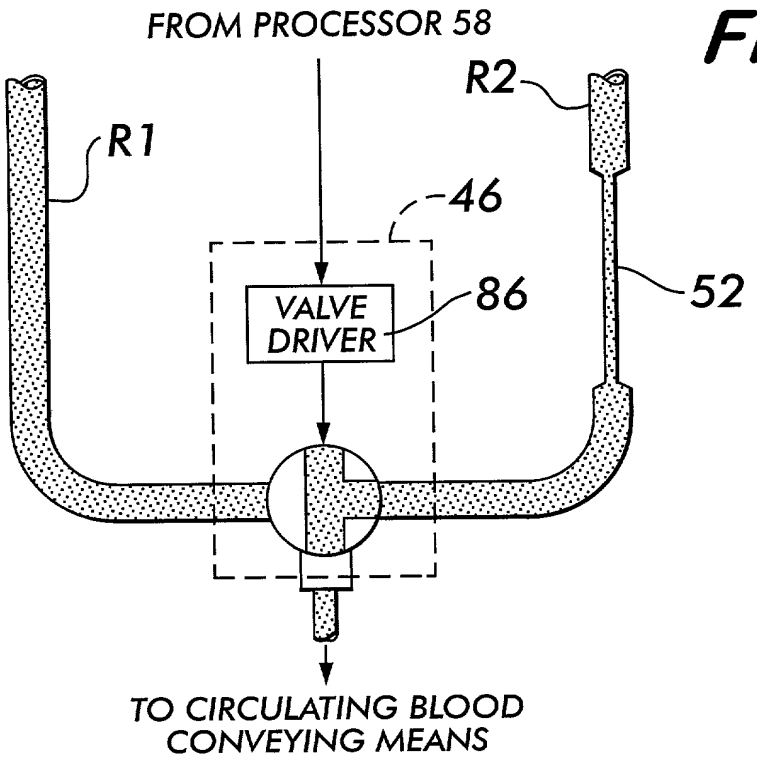

FROM PROCESSOR 58
R2
R1
46
VALVE DRIVER
86
52
TO CIRCULATING BLOOD CONVEYING MEANS

FIG. 7B

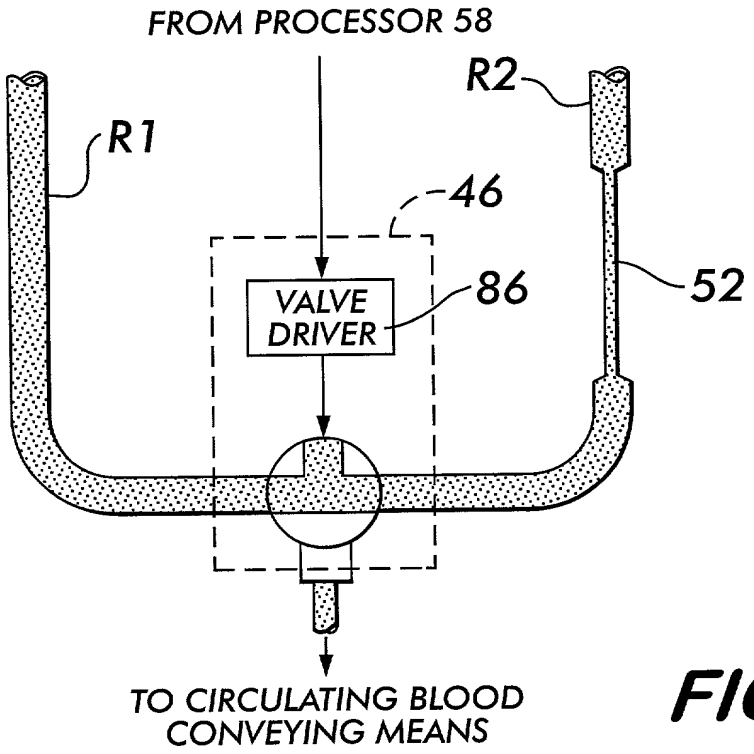
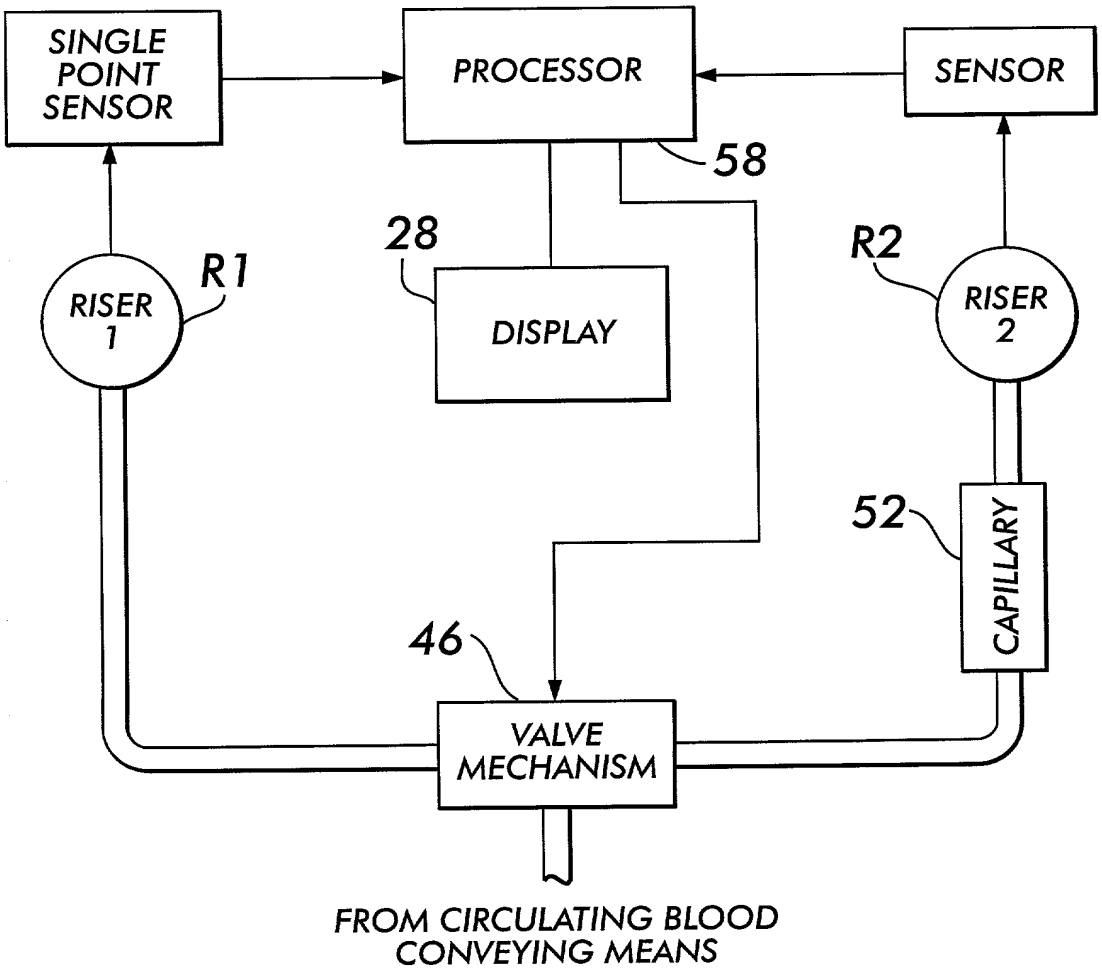

FROM PROCESSOR 58
R2
R1
46
VALVE DRIVER
86
52
TO CIRCULATING BLOOD CONVEYING MEANS

FIG. 7C

FIG.8


SINGLE POINT SENSOR
PROCESSOR
SENSOR
58
28
DISPLAY
R1
RISER 1
R2
RISER 2
52
CAPILLARY
46
VALVE MECHANISM
FROM CIRCULATING BLOOD CONVEYING MEANS

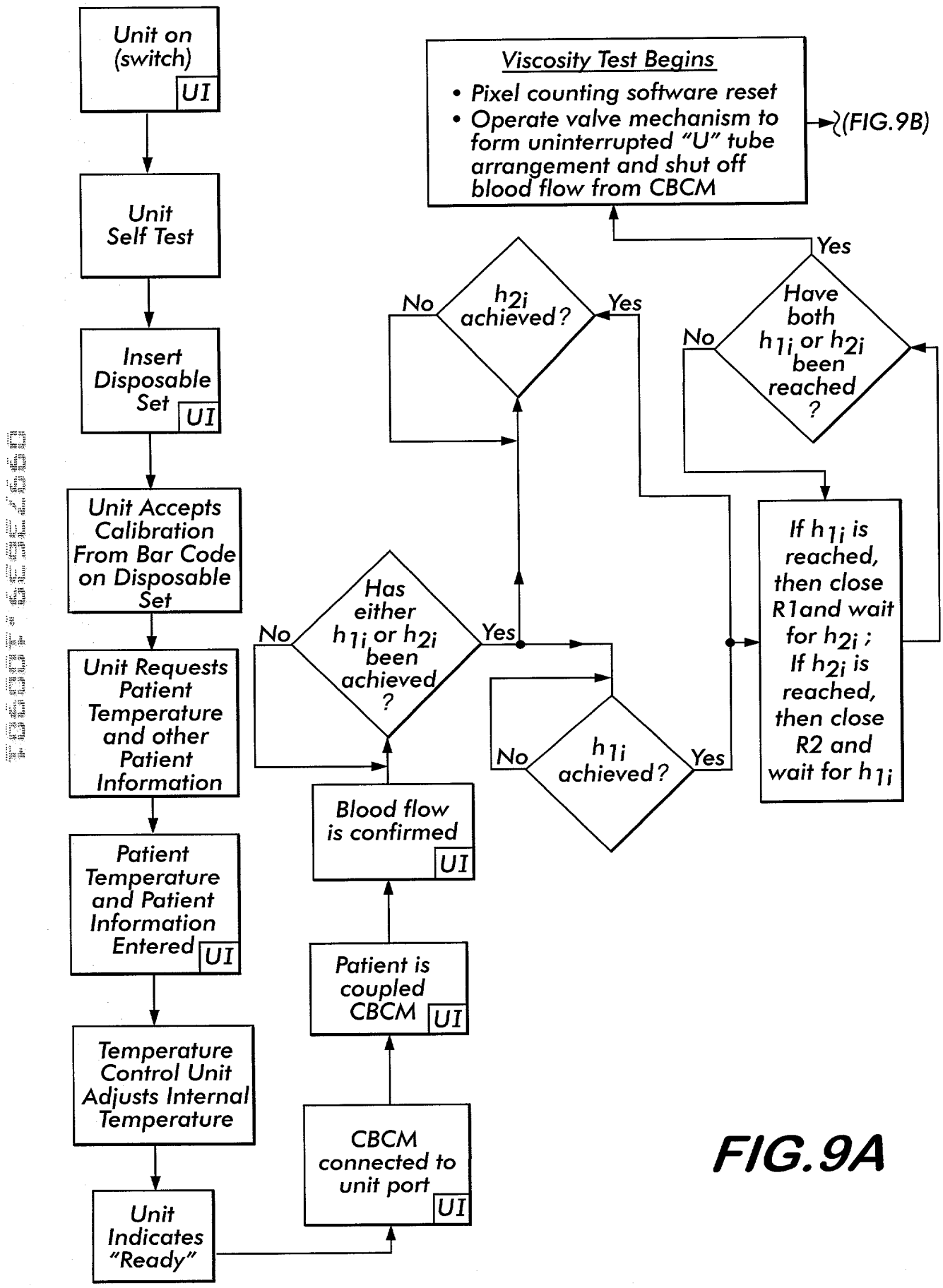

Unit on (switch) UI
Unit Self Test
Insert Disposable Set UI
Unit Accepts Calibration From Bar Code on Disposable Set
Unit Requests Patient Temperature and other Patient Information
Patient Temperature and Patient Information Entered UI
Temperature Control Unit Adjusts Internal Temperature
Unit Indicates "Ready"
CBCM connected to unit port UI
Patient is coupled CBCM UI
Blood flow is confirmed UI
Has either h_{1i} or h_{2i} been achieved ?
No
Yes
h_{1i} achieved?
No
Yes
If h_{1i} is reached, then close R1and wait for h_{2i} ; If h_{2i} is reached, then close R2 and wait for h_{1i}
Have both h_{1i} or h_{2i} been reached ?
No
Yes
h_{2i} achieved?
No
Yes
Viscosity Test Begins
• Pixel counting software reset
• Operate valve mechanism to form uninterrupted "U" tube arrangement and shut off blood flow from CBCM
(FIG.9B)

FIG.9A

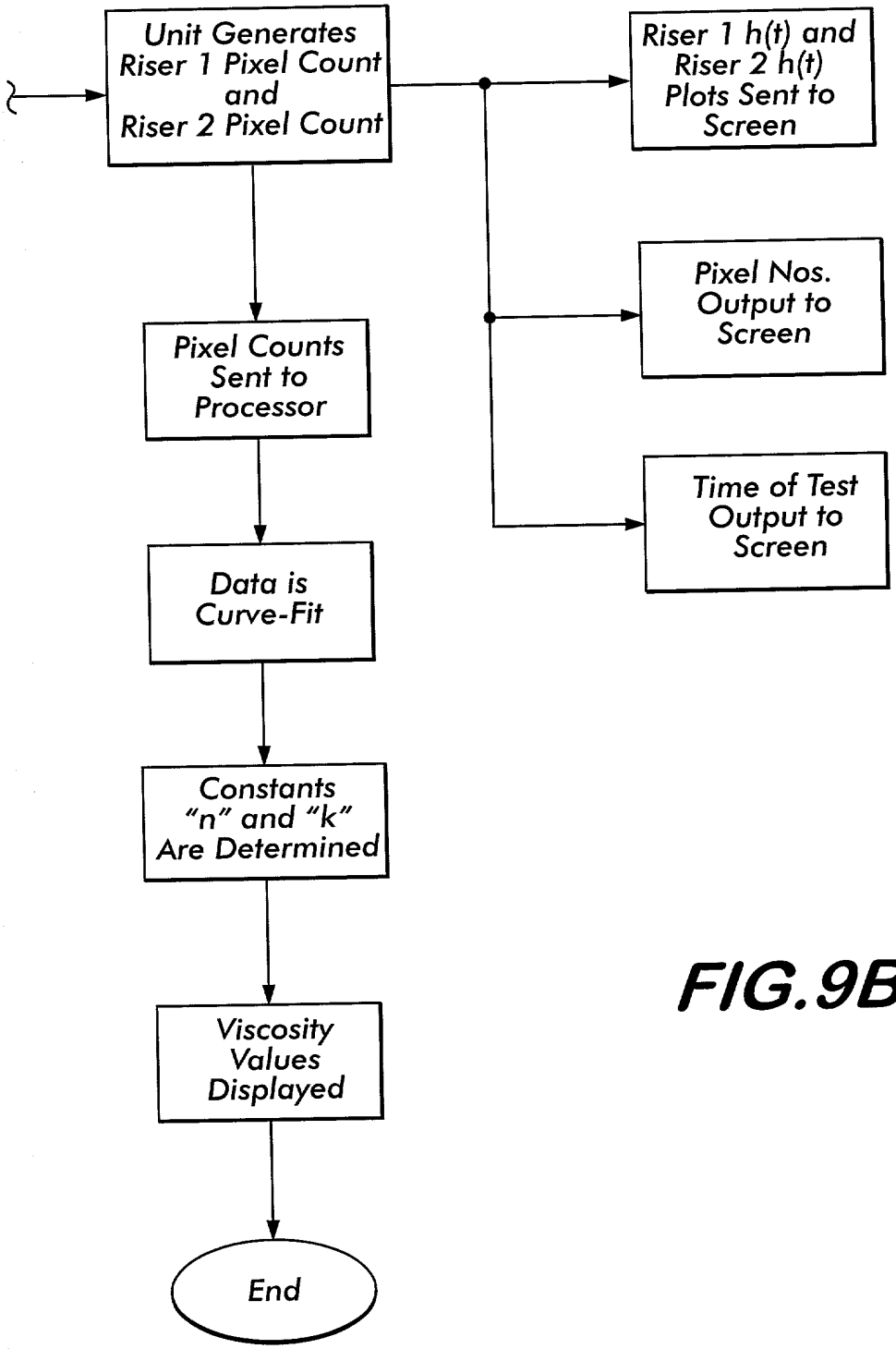

Unit Generates Riser 1 Pixel Count and Riser 2 Pixel Count
Riser 1 h(t) and Riser 2 h(t) Plots Sent to Screen
Pixel Nos. Output to Screen
Time of Test Output to Screen
Pixel Counts Sent to Processor
Data is Curve-Fit
Constants "n" and "k" Are Determined
Viscosity Values Displayed
End

FIG.9B

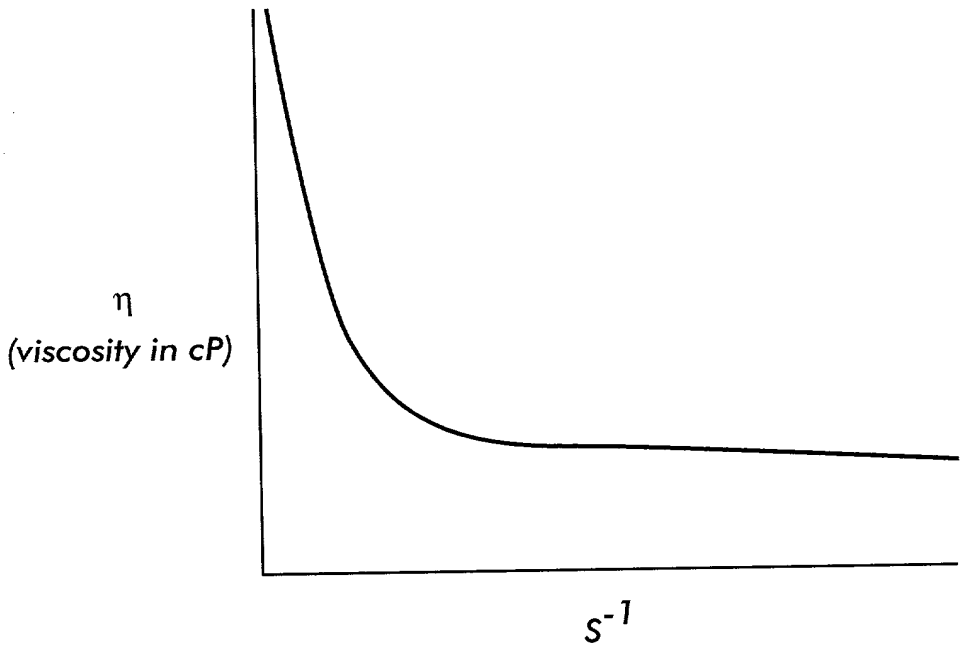


FIG.10A

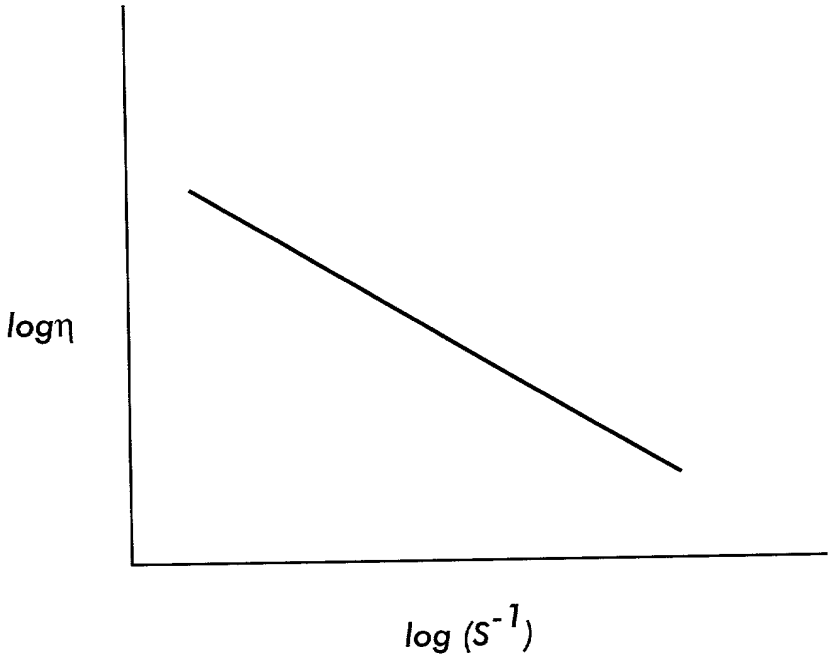


FIG.10B

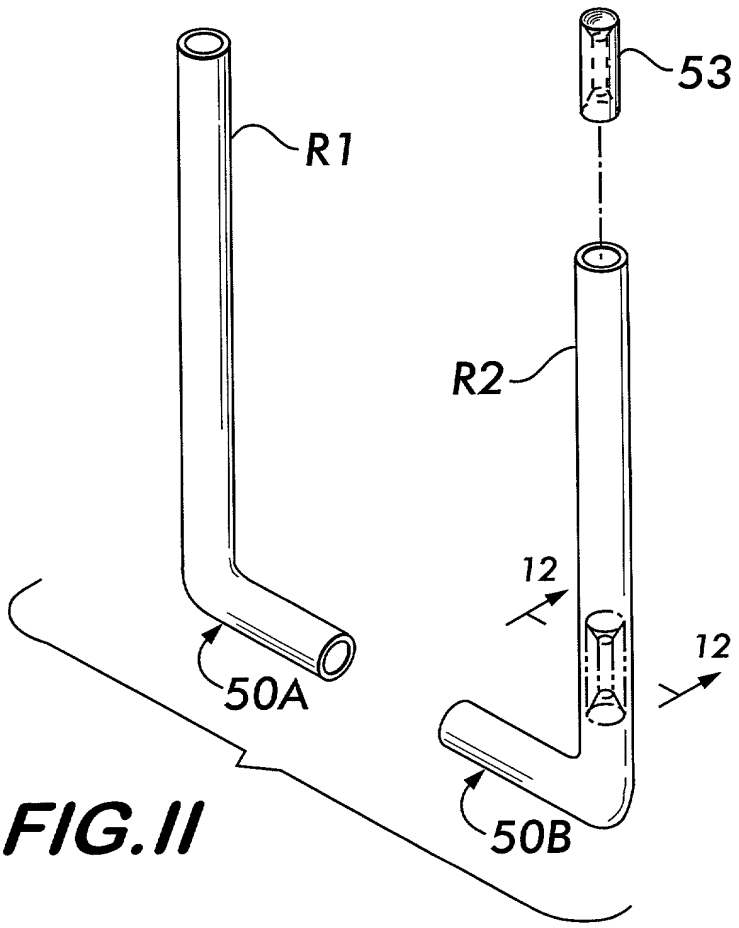


FIG. 11

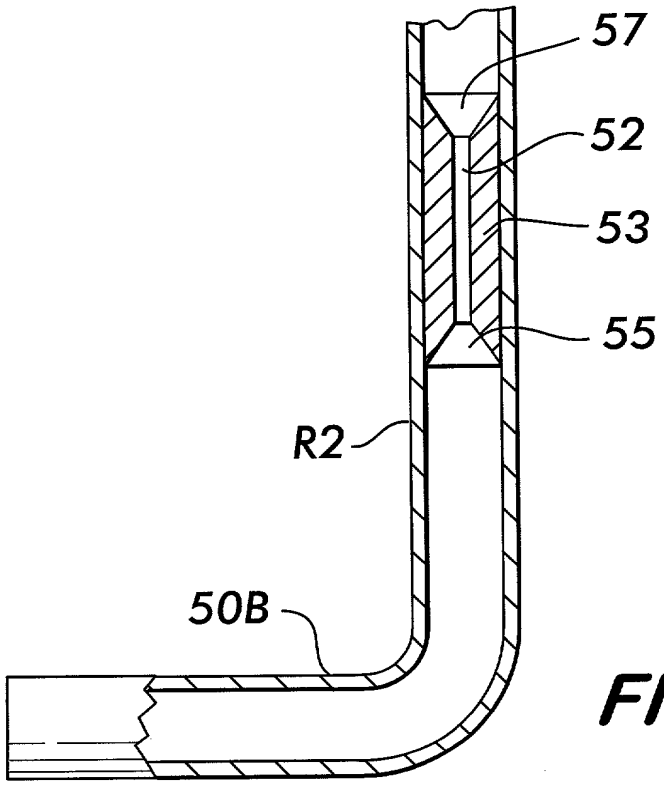


FIG. 12

FIG.13

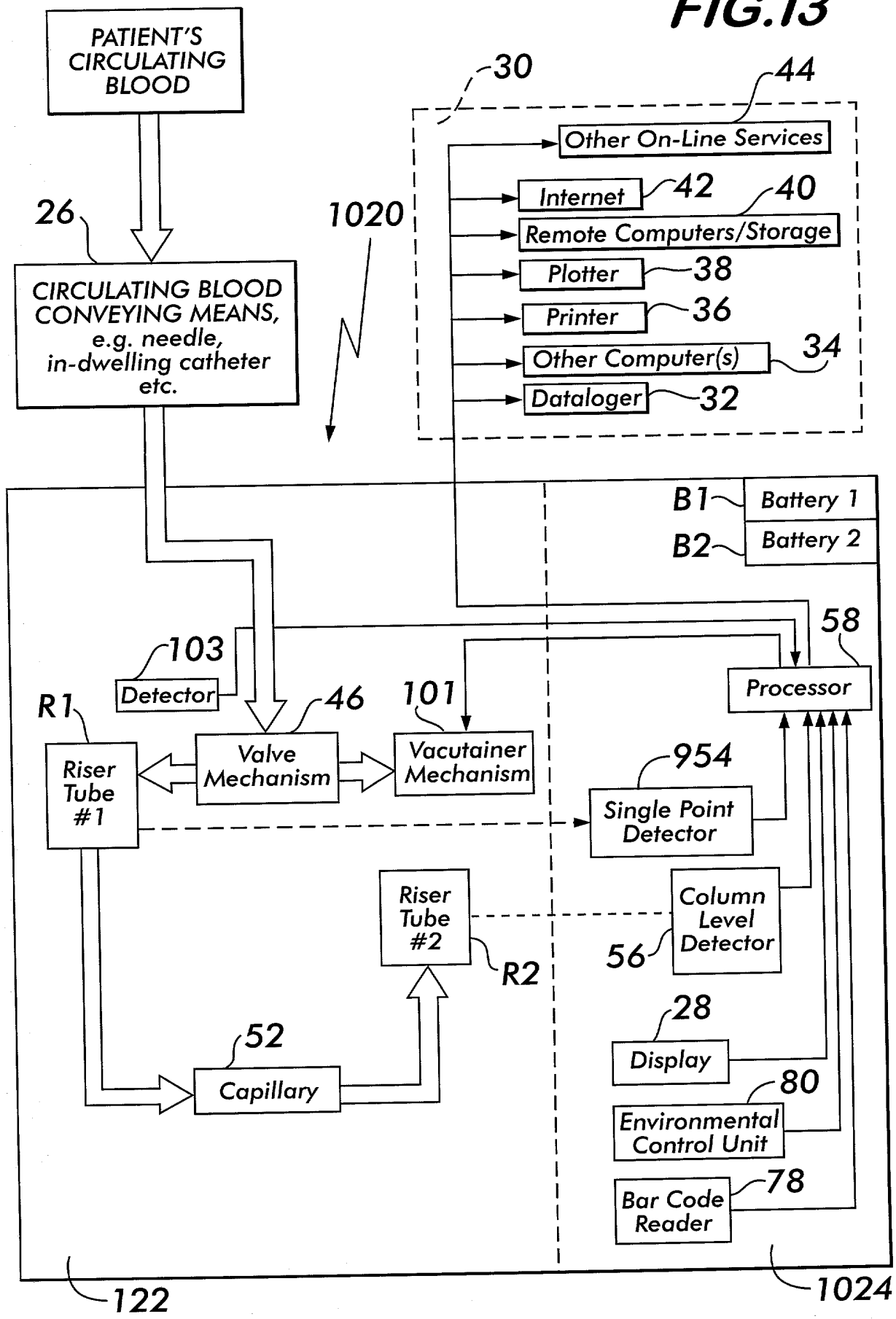

PATIENT'S CIRCULATING BLOOD
26
CIRCULATING BLOOD CONVEYING MEANS, e.g. needle, in-dwelling catheter etc.
1020
30
44
Other On-Line Services
Internet
42
40
Remote Computers/Storage
Plotter
38
Printer
36
Other Computer(s)
34
Datalogger
32
B1
Battery 1
B2
Battery 2
58
Processor
103
Detector
R1
46
Valve Mechanism
101
Vacutainer Mechanism
Riser Tube #1
954
Single Point Detector
Riser Tube #2
R2
Column Level Detector
56
28
Display
80
Environmental Control Unit
78
Bar Code Reader
52
Capillary
122
1024

FIG.14

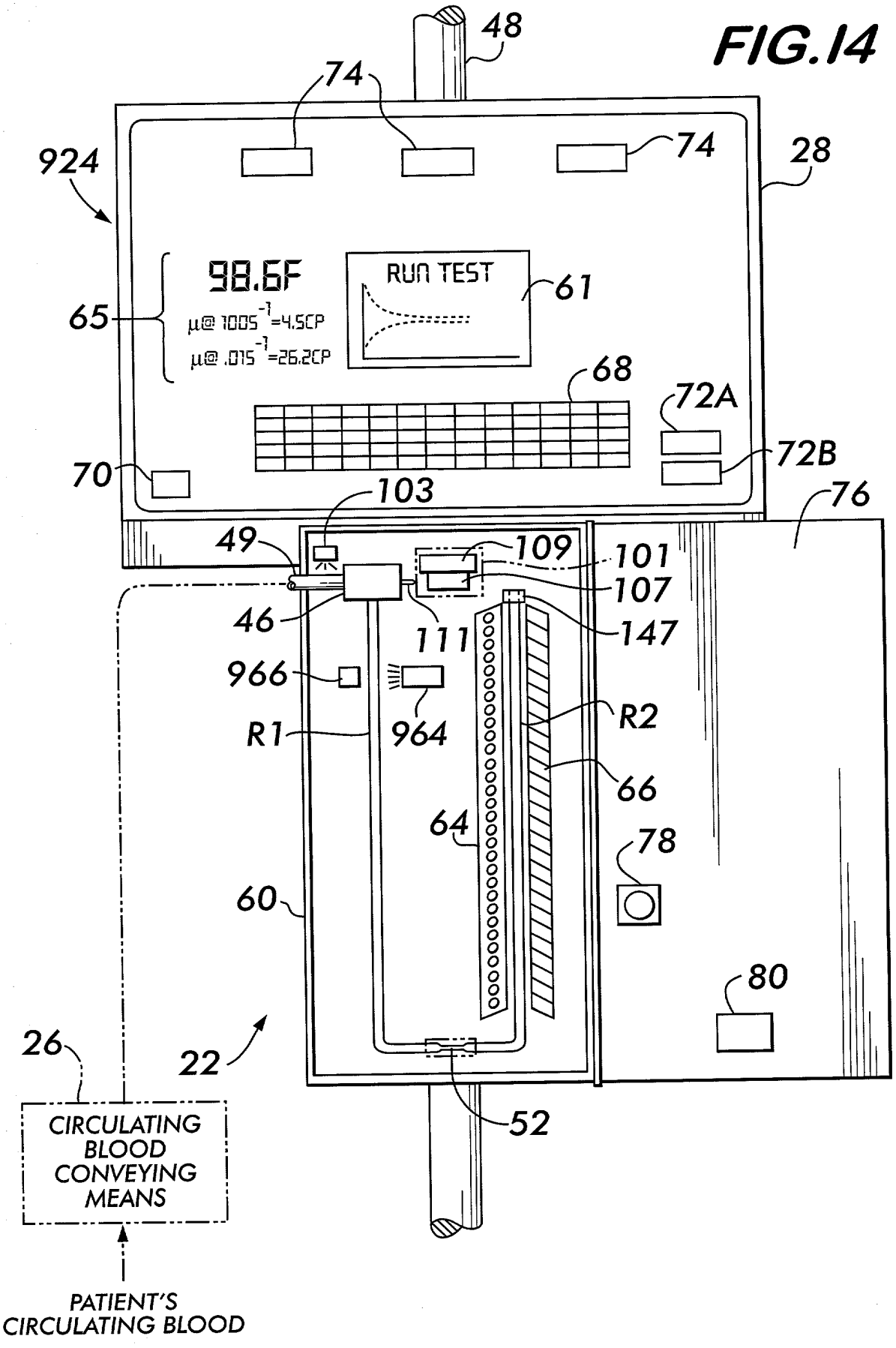

48
74
74
924
28
98.6F
65
μ@ 1005^-1=4.5CP
μ@ .015^-1=26.2CP
RUN TEST
61
68
72A
72B
70
103
76
49
109
101
107
46
111
147
966
964
R1
R2
66
64
78
60
80
26
22
52
CIRCULATING BLOOD CONVEYING MEANS
PATIENT'S CIRCULATING BLOOD

FIG.15

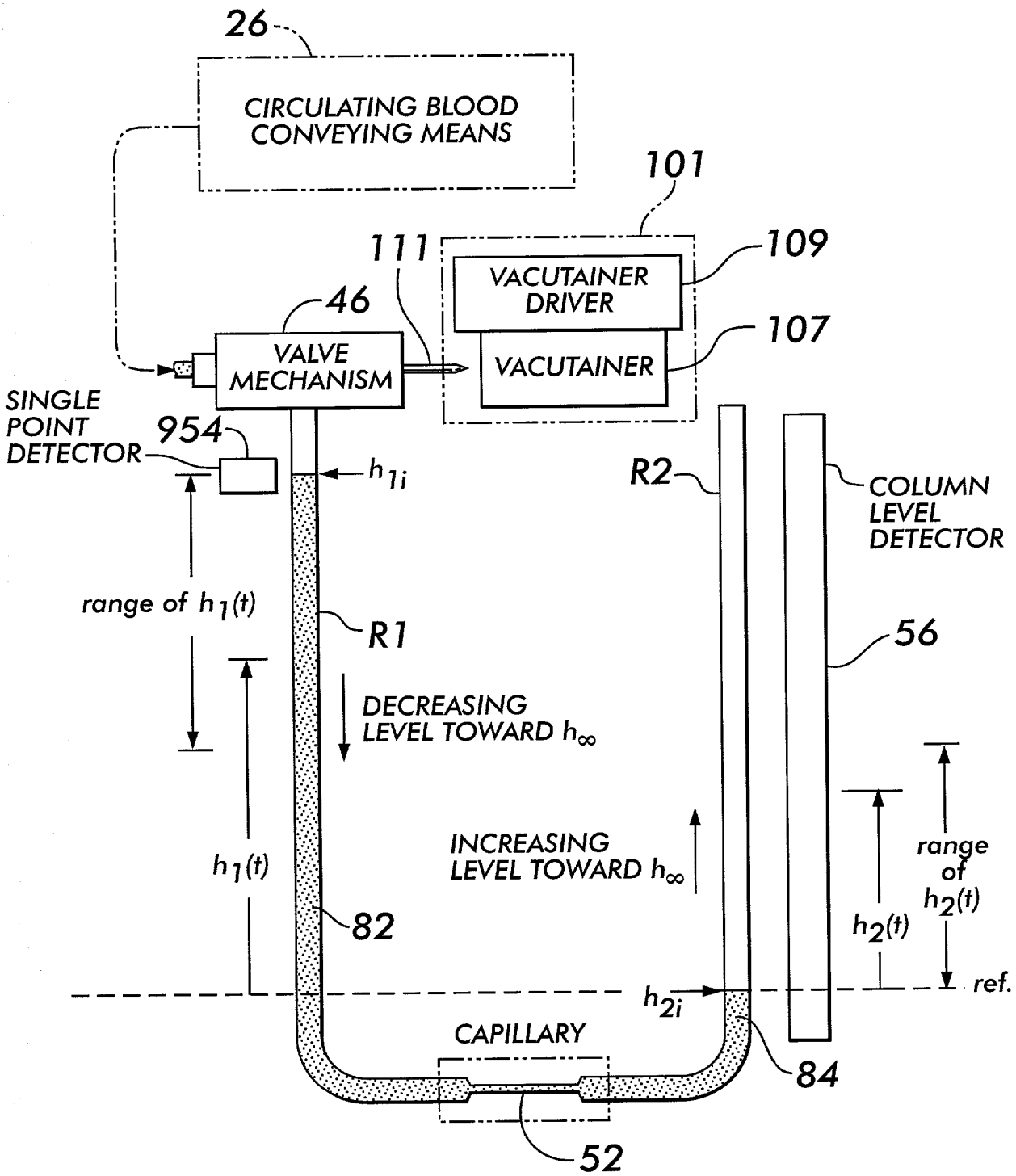
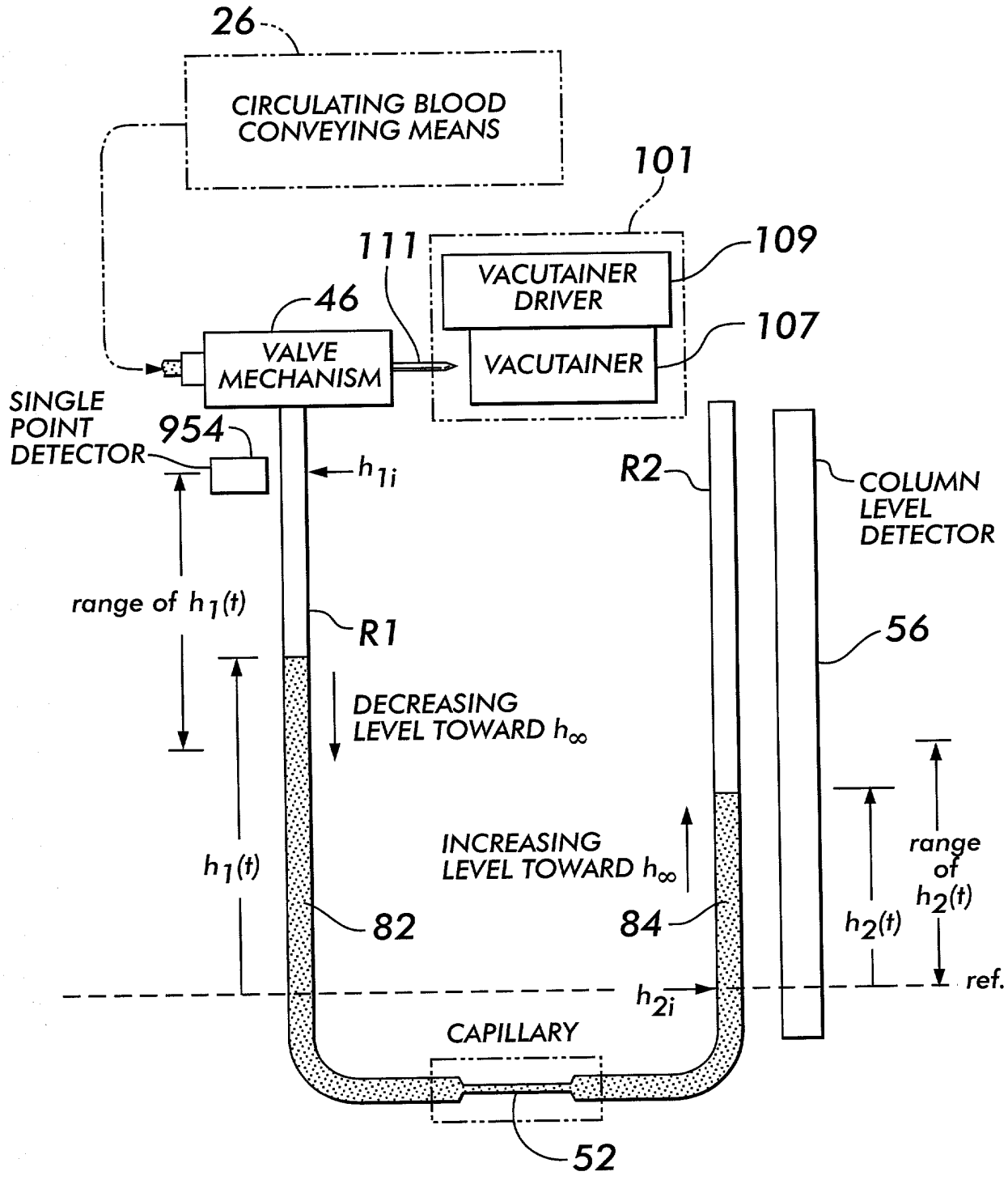

26
CIRCULATING BLOOD CONVEYING MEANS
101
111
109
VACUTAINER DRIVER
46
107
VALVE MECHANISM
VACUTAINER
SINGLE POINT DETECTOR
954
h_{1i}
R2
COLUMN LEVEL DETECTOR
range of $h_1(t)$
R1
56
DECREASING LEVEL TOWARD h_∞
INCREASING LEVEL TOWARD h_∞
range of $h_2(t)$
$h_1(t)$
$h_2(t)$
82
h_{2i}
ref.
CAPILLARY
84
52

FIG.16


26
CIRCULATING BLOOD CONVEYING MEANS
101
111
109
VACUTAINER DRIVER
46
107
VALVE MECHANISM
VACUTAINER
SINGLE POINT DETECTOR
954
h_{1i}
R2
COLUMN LEVEL DETECTOR
range of $h_1(t)$
R1
56
DECREASING LEVEL TOWARD h_∞
INCREASING LEVEL TOWARD h_∞
range of $h_2(t)$
$h_1(t)$
82
84
$h_2(t)$
ref.
h_{2i}
CAPILLARY
52

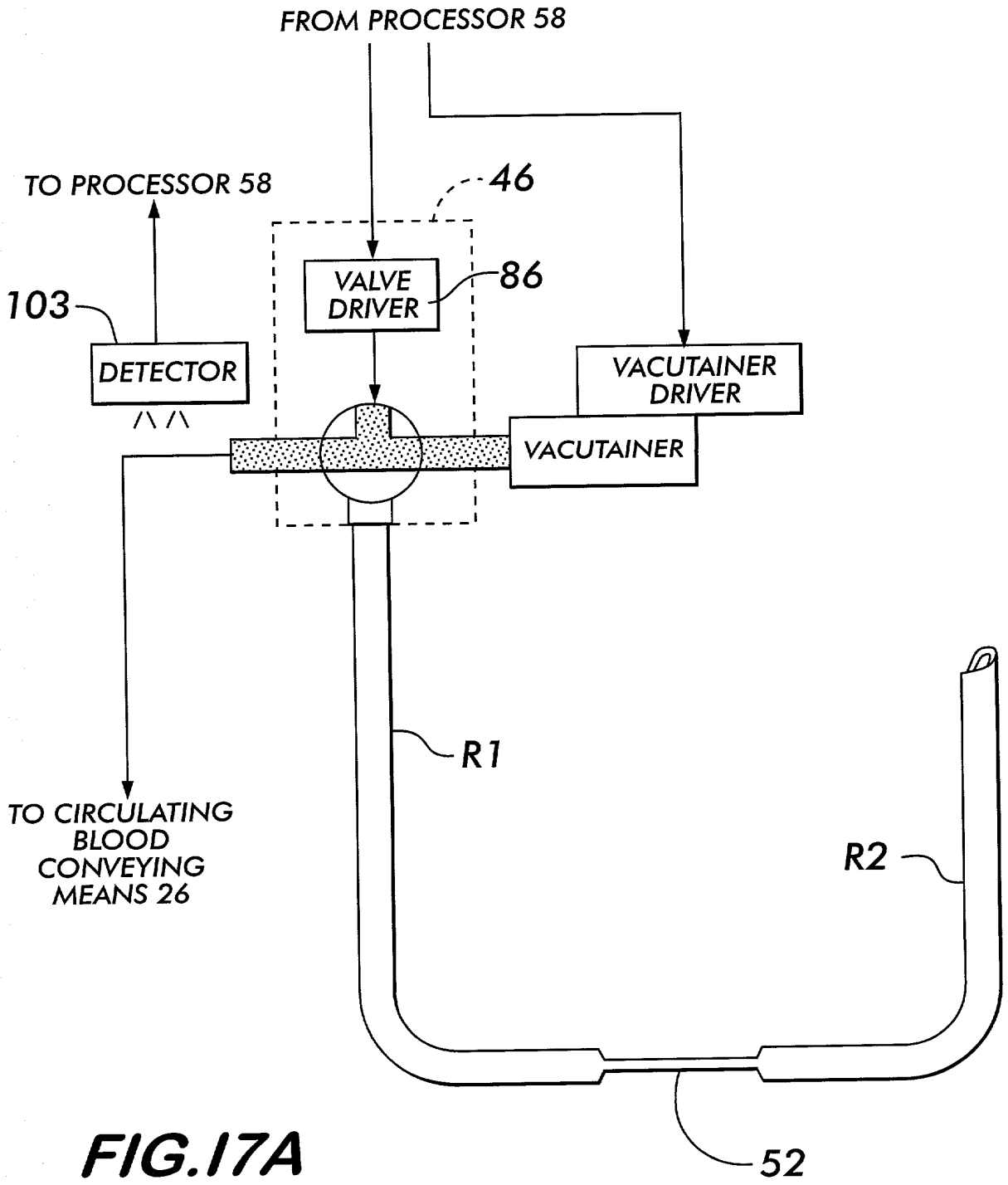

FROM PROCESSOR 58
TO PROCESSOR 58
46
VALVE DRIVER
86
103
DETECTOR
VACUTAINER DRIVER
VACUTAINER
R1
R2
TO CIRCULATING BLOOD CONVEYING MEANS 26
52

FIG.17A

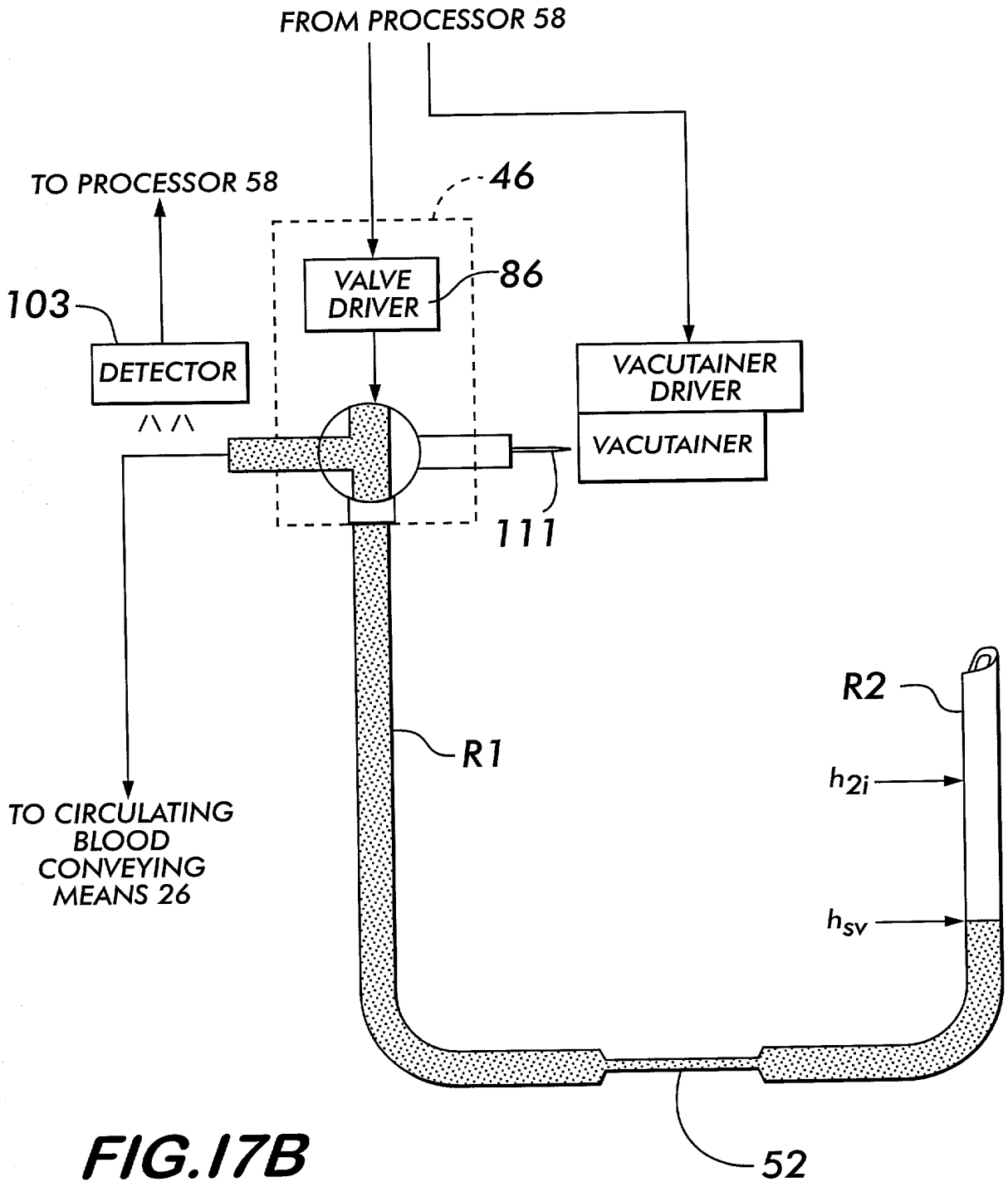

FROM PROCESSOR 58
TO PROCESSOR 58
46
VALVE DRIVER
86
103
DETECTOR
VACUTAINER DRIVER
VACUTAINER
111
R1
R2
h_{2i}
h_{sv}
TO CIRCULATING BLOOD CONVEYING MEANS 26
52

FIG.17B

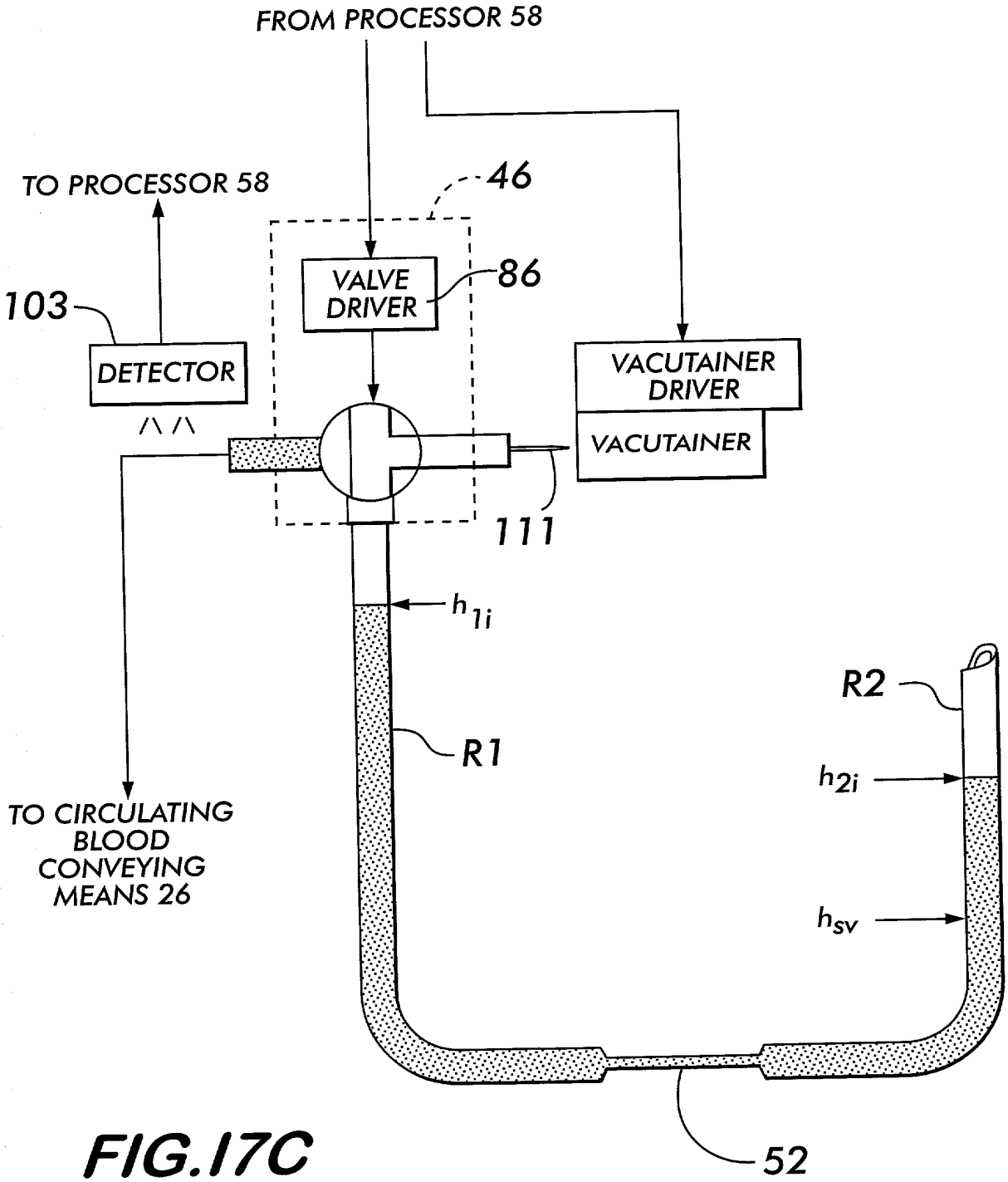

FROM PROCESSOR 58
TO PROCESSOR 58
46
VALVE DRIVER
86
103
DETECTOR
VACUTAINER DRIVER
VACUTAINER
111
h_{1i}
R1
R2
h_{2i}
h_{sv}
TO CIRCULATING BLOOD CONVEYING MEANS 26
52

FIG.17C

FIG.18

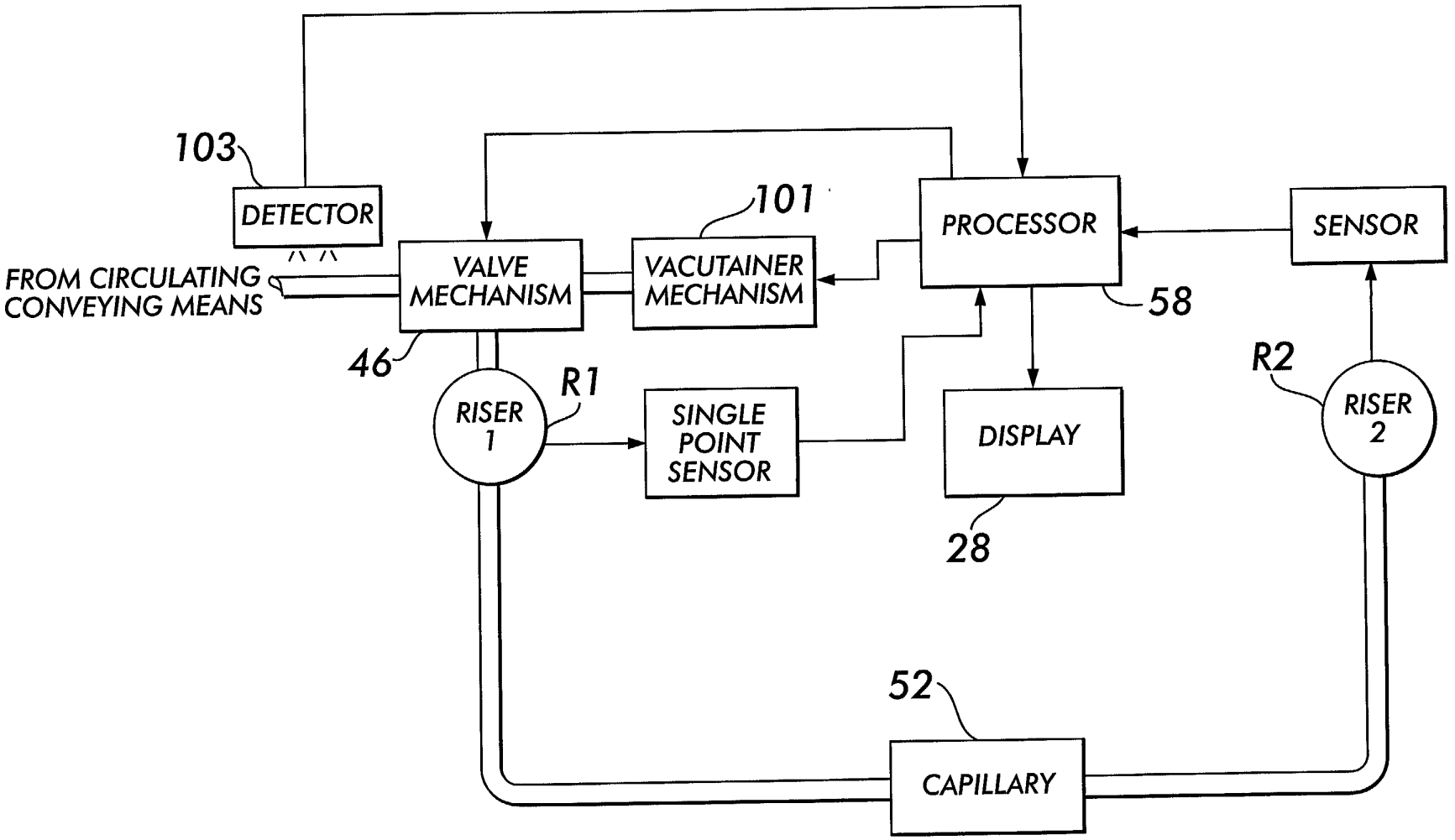
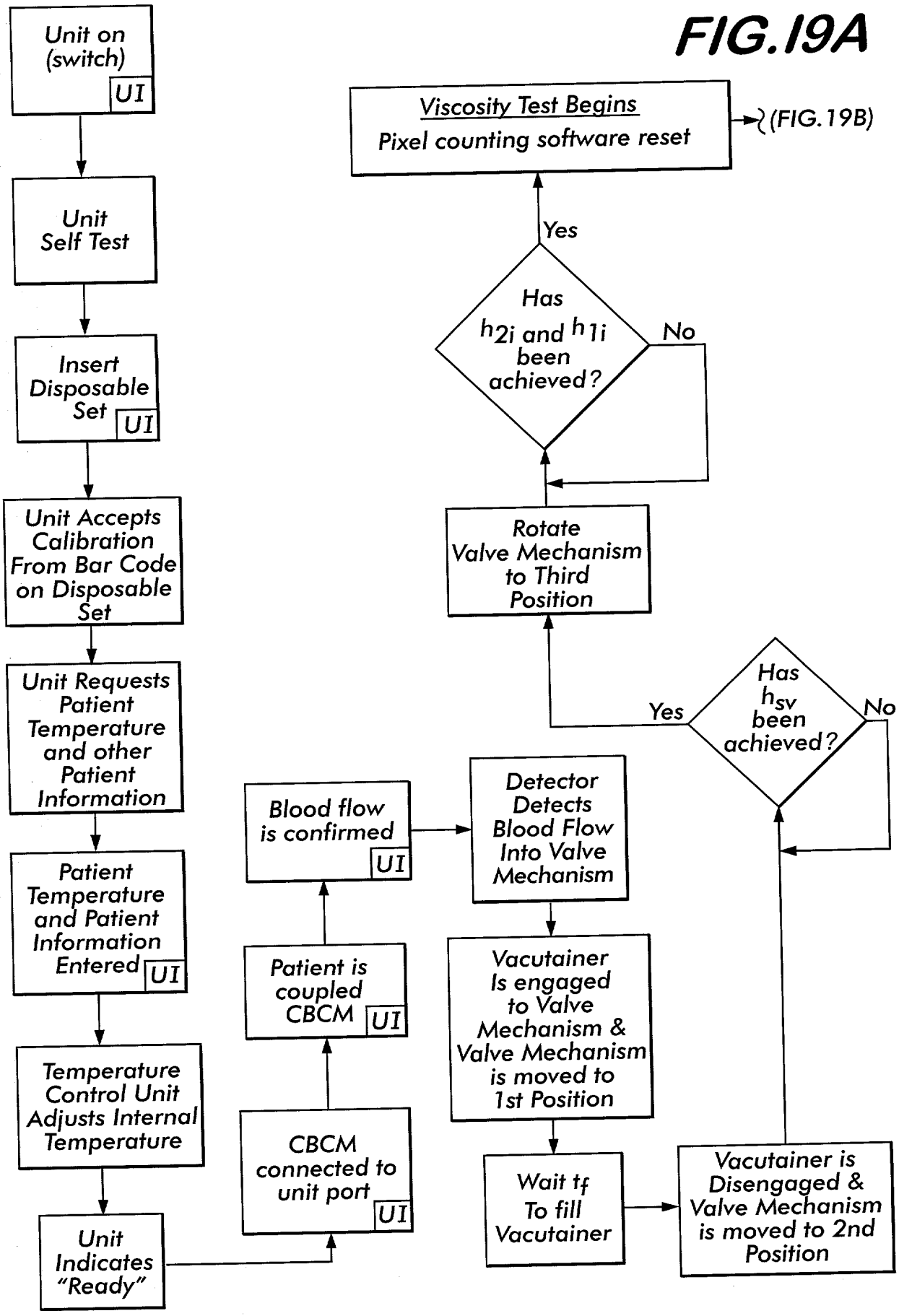


FIG. 19A


Unit on (switch) UI
Unit Self Test
Insert Disposable Set UI
Unit Accepts Calibration From Bar Code on Disposable Set
Unit Requests Patient Temperature and other Patient Information
Patient Temperature and Patient Information Entered UI
Temperature Control Unit Adjusts Internal Temperature
Unit Indicates "Ready"
CBCM connected to unit port UI
Patient is coupled CBCM UI
Blood flow is confirmed UI
Detector Detects Blood Flow Into Valve Mechanism
Vacutainer Is engaged to Valve Mechanism & Valve Mechanism is moved to 1st Position
Wait t_f To fill Vacutainer
Vacutainer is Disengaged & Valve Mechanism is moved to 2nd Position
Has h_{sv} been achieved?
Yes
No
Rotate Valve Mechanism to Third Position
Has h_{2i} and h_{1i} been achieved?
Yes
No
Viscosity Test Begins
Pixel counting software reset
(FIG. 19B)

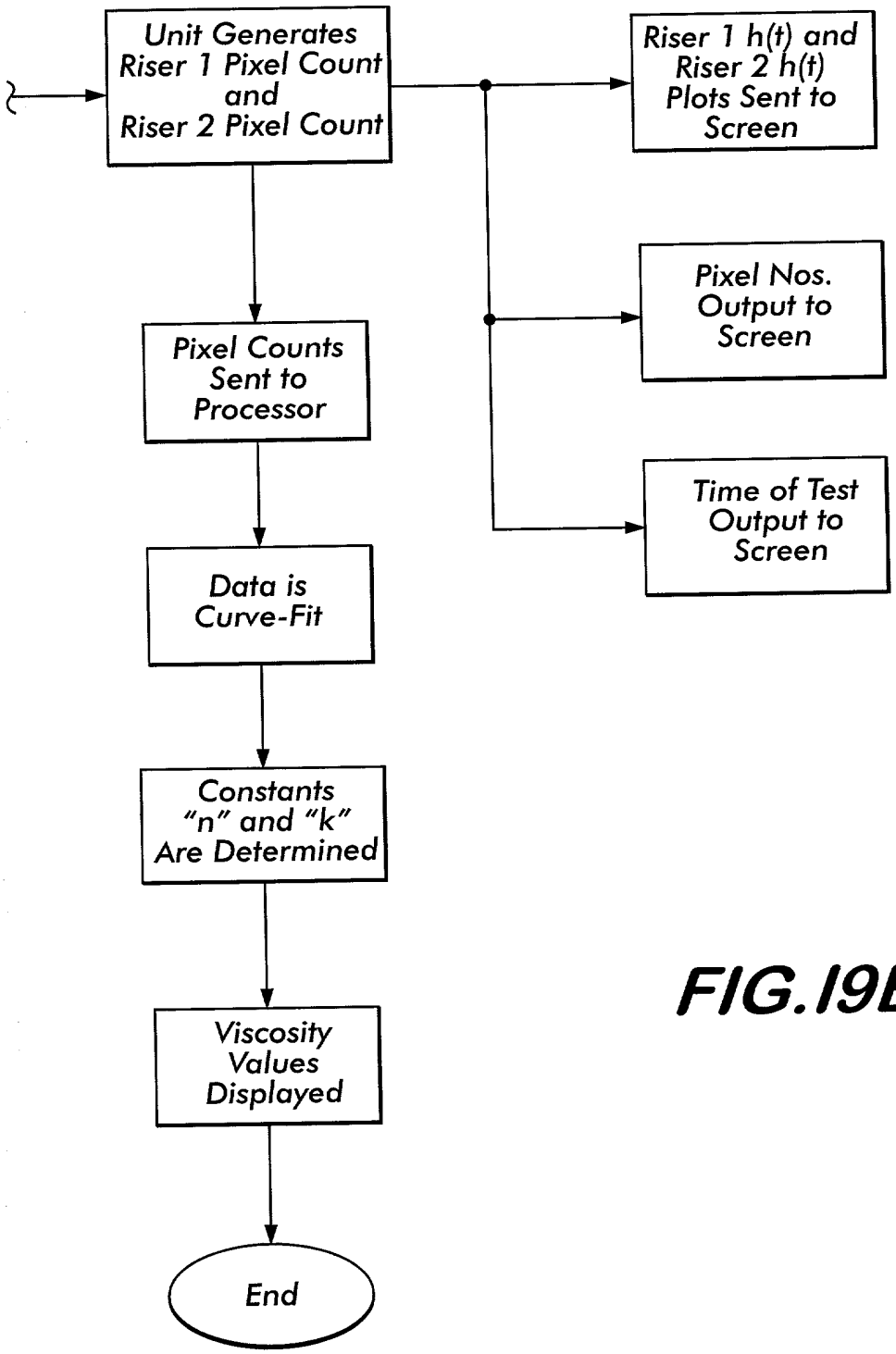

Unit Generates Riser 1 Pixel Count and Riser 2 Pixel Count
Riser 1 h(t) and Riser 2 h(t) Plots Sent to Screen
Pixel Nos. Output to Screen
Time of Test Output to Screen
Pixel Counts Sent to Processor
Data is Curve-Fit
Constants "n" and "k" Are Determined
Viscosity Values Displayed
End

FIG.19B

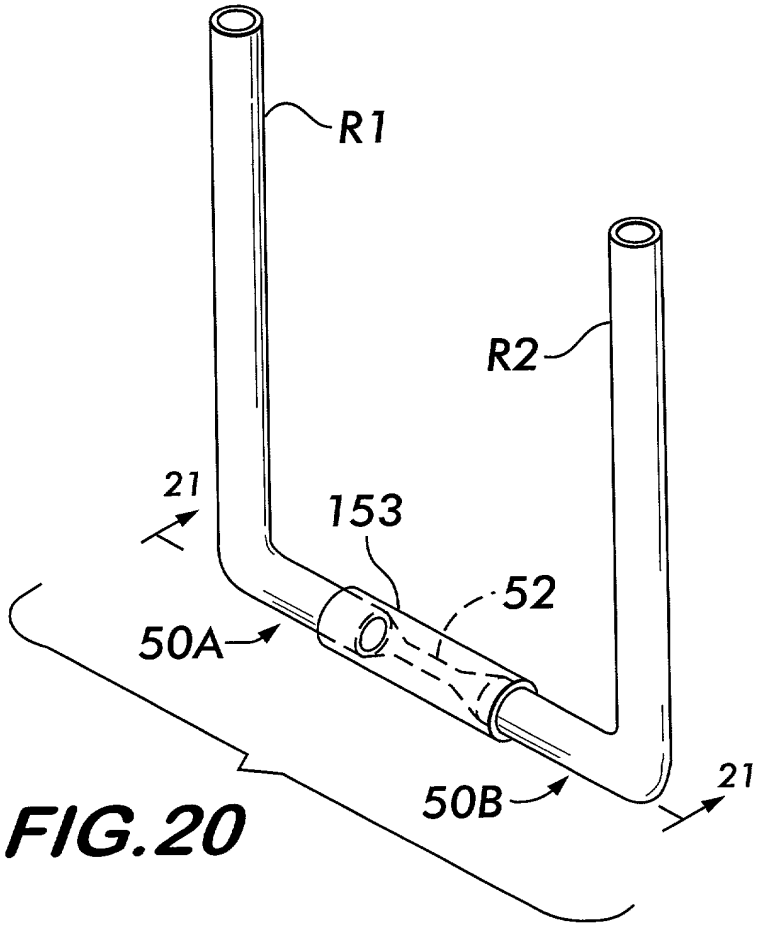


FIG.20

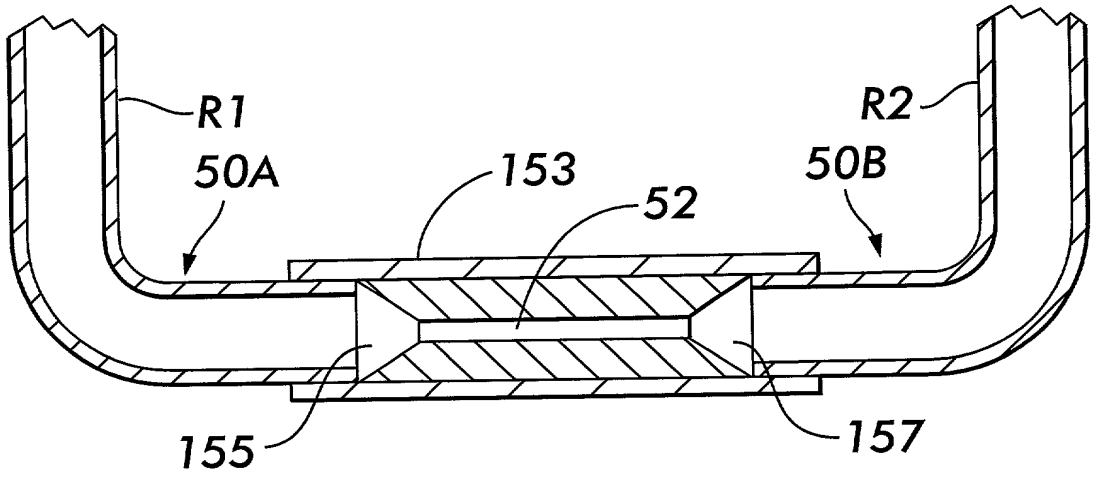


FIG.21